

IN THE CLAIMS

1. (Currently amended) A virtually coherent signal controlled laser oscillator comprising:

a signal controlled laser oscillator that receives a fixed bias input signal and outputs an optical frequency signal $f_0 + f_m$;

5 a signal controlled microwave oscillator that receives a frequency control input signal and outputs a microwave frequency signal, f_m ; and

a single sideband mixer that processes the signal output by the laser oscillator and microwave oscillator to output a single signal controlled optical frequency signal.

2. (Previously amended) The virtually coherent signal controlled laser oscillator recited in Claim 1 wherein the single sideband mixer comprises an optical single sideband mixer comprising:

a zero degree power splitter coupled to an output of the signal controlled laser oscillator;

5 a ninety degree hybrid coupler coupled to an output of the signal controlled microwave oscillator;

first and second optical modulators having first inputs coupled to first outputs of the power splitter and hybrid coupler, and having second inputs coupled to second outputs of the power splitter and hybrid coupler; and

10 an output ninety degree hybrid coupler coupled to outputs of the first and second optical modulators for outputting upper sideband and lower sideband output signals.

3. (Previously amended) The virtually coherent signal controlled laser oscillator recited in Claim 2 wherein the upper sideband output signal is at frequency $f_0 + 2xf_m$ and the lower sideband output signal is at frequency f_0 .

4. (Previously amended) A virtually coherent signal controlled laser oscillator comprising

a signal controlled laser oscillator that receives a fixed bias input signal that outputs an optical frequency, f_0 ;

5 a signal controlled microwave oscillator having a frequency control input signal that outputs a microwave frequency, f_m ;

a single sideband mixer that comprises a radio frequency single sideband mixer comprising:

a zero degree power splitter coupled to an output of the signal controlled laser oscillator;

10 a ninety degree hybrid coupler coupled to an output of the signal controlled microwave oscillator;

first and second optical modulators having first inputs coupled to first outputs of the power splitter and hybrid coupler, and having second inputs coupled to second outputs of the power splitter and hybrid coupler; and

15 an output ninety degree hybrid coupler coupled to outputs of the first and second optical modulators for outputting upper sideband and lower sideband output signals.

5. (Previously amended) The virtually coherent signal controlled laser oscillator recited in Claim 4 wherein the upper sideband output signal is at frequency $f_0 + 2xf_m$ and the lower sideband output signal is at frequency f_0 .